To: Mike Lee - TDEC Permit Coordinator

Re: Proposed Byhalia Connection Pipeline – ARAP Permit # NRS 20.089

I take this opportunity to express my strong opposition to the proposed Byhalia Connection pipeline. I grew up in DeSoto County about two miles from the proposed route and still share the family property with my sisters. I am personally familiar with the deep woods, rolling hills and pastures, along with creeks and swamps within the many watersheds. My background as a geologist gives me an understanding and appreciation for the uniqueness of the massive aquifer providing one of the highest quality water sources in the United States. I also understand the earthquake risk associated with our location within the New Madrid Seismic Zone. Working on the Board of the Edwards Aquifer Authority (covering eight counties in Texas) gives me insight into the management, regulation and protection of such a resource. I now also serve on the Board of Protect Our Aquifer where we are building such protections for the Memphis/Sparta aquifer. The Memphis/Sparta aquifer, supplying drinking water to the City of Memphis and surrounding communities, is the region's greatest natural resource.

Memphis/Sparta Aquifer

Public data (see attachment) from the Center for Applied Earth Science and Engineering Research at the University of Memphis (CAESER) shows that about a quarter of the proposed Byhalia Connection route traverses the unconfined area of the Memphis/Sparta aquifer in DeSoto and Marshall Counties. The unconfined area, also known as the recharge zone, is where the aquifer formation is present at the surface and provides the main source of rainfall infiltration into the aquifer. This means the unconfined area is highly vulnerable to a pipeline leak or rupture which could result in a crude oil spill directly contaminating the source of the region's drinking water. Of course, the entire proposed route should be considered sensitive because even where a confining clay layer isolates the Memphis/Sparta aquifer, a shallow alluvial aquifer is present, and gaps or breaches in the confining clay layer can provide a pathway for surface water and pollution to reach the deeper Memphis/Sparta aquifer. Even if crude oil contamination only impacted the shallow aquifer, it would be harmful to locals who rely on the shallow aquifer for industrial, agricultural and domestic wells.

Consider the Risk

At the Byhalia Connection open house in January (2020), I was informed by the Plains environmental team that no environmental risk assessment of the potential impacts to the Memphis/Sparta aquifer is being prepared for both the construction phase and operation of the proposed pipeline. The thorough review by the Tennessee Department of Environment & Conservation (TDEC) of surface water stream crossings and wetlands impacts is critically important because when surface water is impacted, the groundwater will very likely also be impacted. Plains assertion—that there is no basis for concern regarding contamination of the Memphis/Sparta aquifer because the proposed pipeline will be just a few feet below the surface—is woefully uninformed. There are numerous documented examples in the Memphis area where contamination of surface soil and surface water has seeped into the groundwater of the

shallow aquifer and then, where the confining clay layer is thin or absent, migrated into the deeper Memphis/Sparta drinking water aquifer. Where historical pollution has happened, remediation activity is required by the TDEC and/or the Environmental Protection Agency (EPA). In some cases, remediation efforts have been ongoing for 30 years or more with no completion date in site.

Town of Collierville

The town of Collierville is in the Memphis metropolitan area in eastern Shelby County, Tennessee (over the recharge zone where the confining clay layer is thin or absent) just a few miles north of the terminus of the proposed Byhalia Connection pipeline in Marshall County, Mississippi. Carrier Air Conditioning and Smalley-Piper are two Superfund Sites in Collierville that have contaminated the municipal drinking water with trichloroethylene (TCE) and hexavalent chromium (CH6) respectively. In 2004, one of the towns municipal water plants had to be shut down at tremendous expense, and measures taken to avoid water wells capturing the contaminated plumes. Remediation activities at the Carrier site have been ongoing for over 30 years. The TCE and CH6 contamination originated in the soil and surface water runoff.

TVA

More recently in 2017, TDEC reported high levels of coal ash contamination at the Tennessee Valley Authority (TVA) Allen Fossil Plant (Coal Plant) and new Combined Cycle Plant in southwestern Memphis. Groundwater in the shallow aquifer under coal ash ponds exceeded protection standards for arsenic by 300 times, as well as standards for lead and fluoride. Investigations by the United States Geological Survey (USGS) established hydraulic connection between the shallow contaminated aquifer and the Memphis aquifer at the TVA site. TVA drilled five Memphis/Sparta aquifer water wells at the site to produce cooling water for the new Combined Cycle Plant. TVA is not currently using these wells due to concern over drawing groundwater from the shallow contaminated aquifer into the drinking water source for Memphis and Shelby County. Remedial action to remove arsenic from the shallow groundwater and to remove the coal ash residue is being required under TDEC and EPA rules. The coal ash contamination originated at the surface.

https://pubs.er.usgs.gov/publication/ofr20181097

Valero

Byhalia Connection is a joint venture between Plains All American Pipeline and Valero. It is quite relevant and important to note that a plume of hydrocarbon contamination is present in the shallow aquifer beneath the Valero Refinery where the proposed Byhalia Connection pipeline will originate. Hydrocarbons were reported in the groundwater as early as 1984, followed by an EPA investigation in 1991, and ongoing remediation activities since a TDEC order in 1998. Contamination originated from hydrocarbon waste storage and leaks at the surface. As a joint venture partner with Valero, Plains should be aware of contamination at the Valero site caused by downward leakage from surface sources. Plains assertion that no such danger is posed by a pipeline at the surface is misleading and disingenuous.

MLG&W

The Memphis Light Gas & Water's (MLGW) municipal Davis Well Field is a short distance from the TVA and Valero sites. Analogous to the Collierville example above, MLGW must expend resources to investigate and prevent municipal water wells from capturing contaminated groundwater. Alarmingly, the proposed Byhalia Connection route travels alongside MLGW's Davis Well Field.

Construction Accidents

Sadly, accidents and contamination happen even in the construction phase of a pipeline, as is evidenced by recent accidents during construction of the 430 mile Kinder Morgan Permian Highway Pipeline in Central Texas. In March of this year, construction crews directionally drilling under the Blanco River, spilled 36,000 gallons of drilling fluid into the Trinity Aquifer, contaminating nearby domestic water wells. In May, a crew working on the same pipeline punctured the Vista Ridge water pipeline that supplies the San Antonio Water System spilling 60,000 gallons of water. Residents had to be supplied by tanked water.

Seismic Hazard

The proposed Byhalia Connection pipeline route lies in the New Madrid seismic zone—with a seismic hazard risk as high as that of California. Between 150 to 200 earthquakes are recorded annually within this region. Most are too small to be felt but several of the largest historical earthquakes in the U.S. (magnitudes of 7 to 7.7) occurred along the New Madrid seismic zone in the winter of 1811-1812.
https://earthquake.usgs.gov/hazards/urban/memphis/

As a graduate assistant at the Center for Earthquake Research and Information (CERI) at the University of Memphis, my job was to read the seismograph data and record those earthquakes. So the very real seismic hazard is top of mind for me. A pipeline leak or rupture induced by a seismic event could be catastrophic to the nearby residents and result in long-term contamination of property, surface water and groundwater.

I discussed the high seismic hazard, special precautions and permitting requirements with Byhalia Connection's construction team. I was informed that an operating permit is acquired from the Department of Transportation (Federal Regulation 195) that states under "design" that the operator must "consider" external forces including seismic activity, but it is not specific. Plains engages a third-party consulting firm to study and recommend mitigating activity, but this report is not required to be submitted for the permit.

Written inquiries about a public safety plan were not answered. I have not read or heard of any system or plan in the case of an earthquake. Residents should know what to do and how Plains will respond to any pipeline disruption. Given the value of the Memphis/Sparta aquifer and its importance to the citizens of Tennessee and Mississippi, such "consideration" should be part of this project.

Conclusion

Because there will be no environmental risk assessment regarding impacts to the Memphis/Sparta aquifer or seismic hazard, the TDEC review of surface water impacts is vitally important. With no individual surface water permit required in Mississippi, TDEC's ARAP Individual Permit for Stream and Wetlands Impacts will be the maximum regulatory scrutiny this consequential project will receive. Water flow in the Memphis/Sparta aquifer is connected between Tennessee and Mississippi. If the aquifer is contaminated in Mississippi, it could impact the drinking water in Tennessee. Thus, there is incentive for TDEC to work with USACE in Mississippi to prevent the threat of contamination.

Thanks to recent and ongoing studies by CAESER and USGS, we have a much better understanding about gaps in the confining clay layer and the hydraulic connection between the shallow aquifer and the Memphis/Sparta aquifer. We also have the advantage of recognizing documented cases from decades past of surface water contamination vertically migrating into and polluting our drinking water aquifer. CERI at the University of Memphis has vastly improved our understanding of the earthquake risk in the region and the need for more stringent building standards and community preparedness. This information was not available or well understood when many existing industrial facilities and infrastructure projects were approved. Today with the benefit of more precise science, clearly illustrating the vulnerability of the deep aquifer from surface pollution, we must employ all tools and knowledge in making smarter planning decisions to protect our surface water, our groundwater and our communities impacted by this pipeline.

Finally, I implore you to approach the review process for the proposed Byhalia Connection pipeline project with the same care and attention as if it were routed through your own neighborhood, exposing your family and community to the well known negative impacts and risks associated with construction and operation of a crude oil pipeline. Those of us who will actually bear the consequences are relying on you.

Respectfully,

Ex. 6 Personal Privacy (PP)